

Mars Technology Demonstration Support

Canceled Technology Project (2016 - 2018)



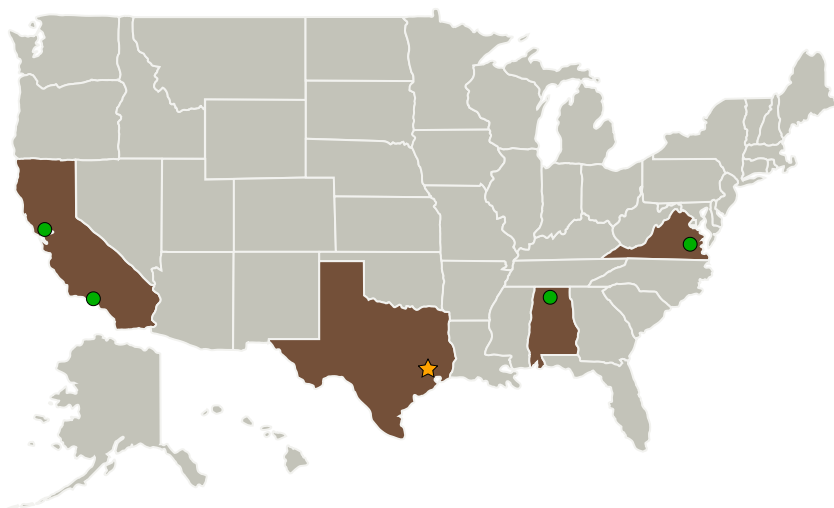
Project Introduction

Many U.S. Mars landers have used propulsion for subsonic deceleration as the surface is approached. Prior to this effort, no supersonic retro propulsion data existed utilizing actual propulsion hardware. This project is capitalizing on a unique partnership to improve knowledge of the use of supersonic retro propulsion.

Anticipated Benefits

NASA Funded: No currently funded NASA missions are utilizing SuperSonic propulsive deceleration technologies derived from PDT investments. Potential NASA Mars Human precursor missions in the mid-2020 timeframe, or commercial application of these technologies in the next decade, represent the earliest potential infusion opportunities. **NASA Unfunded:** Future high mass robotic and human missions at or above ~3mt will require this technology. Propulsive-based SuperSonic deceleration capabilities are the only known technology that can close this gap. **OGA:** No applications have been identified for utilization by OGAs. **Commercial:** Advancement of SRP for terrestrial launch veh. return and reusability would be of benefit to the comml ind. **Specific opps.** May include Blue Origins, and Space x. **Nation:** The application of these technologies would advance NASA's ability to land humans on the surface of Mars in the 2030's.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Game Changing Development

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Co-Funding Partners	Type	Location
European Service Module(ESM)	NASA Other	
Exploration Capabilities	NASA Program	
Planetary Science	NASA Program	
The CoOperative Blending of Autonomous Landing Technologies(COBALT)	NASA Other	

Primary U.S. Work Locations	
Alabama	California
Texas	Virginia

Project Management

Program Director:

Mary J Werkheiser

Program Manager:

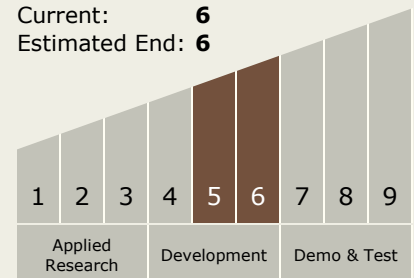
Gary F Meyering

Principal Investigator:

Charles H Campbell

Technology Maturity (TRL)

Start: 5
 Current: 6
 Estimated End: 6



Target Destinations

Earth, Mars

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Project Transitions



April 2016: Project Start



January 2018: Project canceled because other

Rationale: Project canceled because other



January 2018: Closed out

Closeout Summary: This was a support function for SpaceX's Mars Demonstration Mission. Per agreement with stakeholders, the project did not have any TRL or KPP definitions. SpaceX cancelled their Red Dragon mission and as a result, this project is being closed out. This project was a SpaceX led activity supporting a potential Red Dragon Mars flight demonstration that was suspended. Primary goal for NASA within the project was the acquisition of retro-propulsion descent flight data for a Mars entry spacecraft design to land approximately six times the mass of the largest Mars lander to date. No flight data were obtained as the project and partnership was suspended by SpaceX partially through implementation.